

the ground to the top of some upright fronds, 18 feet; from the ground to the crown, clean stem, 13 feet; girth at the bottom of the stem, 8 feet; girth $5\frac{1}{2}$ feet from the ground, $4\frac{1}{3}$ feet; length of fronds, 10–12 feet. About halfway from the ground this plant is divided into two stems, each stem supporting a beautiful head. No. 2. Length of clean stem, 18 feet; girth at the bottom, 7 feet; girth 5 feet from the ground, $5\frac{1}{2}$ feet; length of fronds, 5 feet. No. 3. Clean stem from the ground to the crown, 20 feet; divides into two stems, one measuring 11 and the other 8 feet; girth where the stem divides, 5 feet; length of fronds, 6 feet. No. 4. Length of stem, 20 feet; girth at bottom, 6 feet; girth 6 feet from the ground, 4 feet; length of frond, 5–6 feet.

6. "Notice of Plants collected in the Isle of Skye," by Dr. John Alexander Smith and Dr. Gilchrist.

Dr. Smith, while residing at Armadale Castle, Skye, in October and November last, observed a few interesting plants in the neighbourhood; *Sticta Pulmonaria* was in great abundance and in fine fruit on the trees. *Himanthalia lorea* formed large patches on the rocks along the shore.

ZOOLOGICAL SOCIETY.

January 12, 1858.—Dr. Gray, F.R.S., V.P., in the Chair.

A MONOGRAPH OF THE GENUS NYCTOPHILUS.

BY ROBERT F. TOMES.

The characters of the present genus were first briefly given by Dr. Leach in a communication to the Linnæan Society in March 1820, which was not, however, published until 1822.

The paper is entitled, "The characters of seven genera of Bats with foliaceous appendages to the nose;" the seven genera being, *Artibeus*, *Monophyllus*, *Mormoops*, *Nyctophilus*, *Megaderma*, *Vampyrus*, and *Madateus*.

From the manner in which *Nyctophilus* is here associated with the other genera, it seems not unfair to assume that Dr. Leach regarded it as more or less closely affined to them; and they, with the exception perhaps of *Mormoops*, all appertain to the *Phyllostomidæ*.

M. Temminck, in his monograph of the genus, gives it as his opinion that it may properly be placed between *Rhinolophus* and *Nycteris*; and Dr. Gray, although arranging it amongst the *Vespertilionidæ*, or Simple-nosed Bats, nevertheless places it immediately after *Nycteris*, which he considers as belonging to the *Vespertilionidæ* also. But *Nycteris* is thought by some zoologists to have some affinity with the *Rhinolophidæ*, and my own repeated examinations have convinced me that it is simply a modification of *Rhinolophus*.

From this it would seem that the genus *Nyctophilus* has always been considered by those who have studied the subject as either belonging to the *Istiophori* or Leaf-nosed Bats proper, or as having some affinity with them.

It will be the purpose of the present paper to show that the genus

Nyctophilus is not more remote from the genus *Vespertilio*, than are the genera *Barbastellus* and *Plecotus*, and further to show that it is as intimately allied to the last of these as to any other genus.

In the course of a very careful study which I have made of the crania of a number of examples, I have detected one or two errors in the account given of the dentition, both by Dr. Leach and M. Temminck. These will be pointed out in their proper place.

FAM. VESPERTILIONIDÆ.

GENUS NYCTOPHILUS.

The top of the head is but slightly elevated, not more so than in *Plecotus auritus*, and the muzzle is relatively of about the same length and substance as in that species. The forehead, between the eyes, is a little depressed, producing a slight hollow somewhat as in the genus *Taphozous*, but in a much less degree. The nose-leaves are simple; the first is placed immediately above the nostrils; it is transverse, and there is a kind of thickened line or ridge passing from the lower margin of the nostrils on each side, and uniting with its outer boundaries. The upper margin of this leaf is straight and even. The second nose-leaf is placed at a greater distance from the first, than the first is from the nostrils. It is also transverse, but is higher in the middle than at the sides, is much thicker in substance, and is thickly clothed with short bristly hairs. The nostrils are small and not prominent, nearly round when seen in front, but with a backward narrow extension nearly reaching to the outer margin of the first nose-leaf, when examined laterally. The ears are large,—about one-fourth longer than the head,—regularly ovoid, and one-fourth longer than wide. They are united at their bases by a piece of transverse membrane across the top of the head, as in *Plecotus*. This membrane is not attached to the inner edge of the ears, but to their hinder surface, so as to leave the margins free. It extends for nearly one-third of the length of the ear. The tragus is short and broad, but rather thin and membranous. Quite at its root it is narrow; but it suddenly attains its full breadth, and taking at once a vertical direction, tapers somewhat unevenly to a narrow but rounded point. The outer margin, near to the base, is the most prominent part; it is rounded, and in some individuals with one or two projecting points. Above this prominence, about the middle of the outer margin, it is slightly hollowed or scooped out, and the inner margin has a corresponding prominent outline immediately opposite to this hollow. The tip is much narrower than any other part of the tragus, but it is nevertheless quite rounded. Although the general form of the tragus is pretty similar in all the examples I have seen, yet it appears liable to greater variations than is usual in most species of *Vespertilionidæ*. For instance, in some examples the margins, although possessing a somewhat undulating outline, are nevertheless smooth; whilst in others the whole of the outer one is finely crenulated; again, the tip is sometimes curved a little inwards, but in others it is quite straight.

The organs of flight so exactly resemble those of the genus *Vespertilio*, that it is needless to make further remarks on them, excepting to mention that the wing-membranes spring from the base of the toes.

All the hinder extremities may be similarly dismissed.

The cranium in its general appearance resembles that of several species of *Vespertilionidæ*, and so nearly, that it would be easy at first sight to confound them. The *Serotine Bat* of Europe, the *Scotophilus Carolinensis* and *Vespertilio velatus* of America, but more especially a species inhabiting the same country as the *Nyctophilus*, viz. *Vesp. Tasmaniensis*, may be cited as species, the crania of which are most like that of *Nyctophilus*.

The cerebral portion is but little elevated above the facial portion, and it rounds off but very little from the vertex to the occiput, above the foramen of which is a moderately developed occipital crest, varying considerably in different species. There is the same deep notch in the anterior part of the skull which is observable in *Vespertilio* and *Scotophilus*, caused by the imperfect development of the intermaxillary bones. Immediately above this notch is a rather broad but shallow depression, occupying the position of the nasal bones. It is as deep from side to side as from before to behind; but there is one point where it runs a little deeper than elsewhere, just at the hinder ends of the nasal bones. Precisely the same kind of depression occurs in the cranium of the *Barbastelle Bat*. But in *Nyctophilus* the depression is rendered more conspicuous by the somewhat more elevated position of the *malar processes*.

The zygomatic arches are not very much arched outwards, less so than in many species of *Vespertilio*, such as *V. Nattereri*, but quite as much so as in *Plecotus*. The orbits extend rather markedly forward, in one species almost to the root of the canine tooth, whilst the palatal portion of the maxillary bones reaches as far back as usual, so as to give a somewhat greater extent of *floor* than ordinary to the orbit. The bony palate extends backwards almost to the condyloid fossa; but its hinder margin is so much scooped out that its middle does not much exceed the middle of the zygomatic arch, in a backward direction. In this respect it resembles the same part in *Plecotus*; in *Barbastellus*, *Vespertilio*, and *Scotophilus* it is doubly emarginate.

The teeth of the upper jaw, when seen from below, present two straight lines, somewhat diverging towards their hinder ends, just as in *Vesp. velatus*, *Scot. serotinus*, *Scot. Carolinensis*, and *Barbastellus*. The two incisors are the only teeth which deviate from these lines, being placed more inward than the canines, which terminate them. Seen laterally, the upper teeth have a curved outline, bending slightly upward from the root of the zygoma to the most anterior part of the intermaxillary bone. The exact form of the lower margin of the maxillary and intermaxillary bones is tolerably well indicated by the range of the teeth, as just stated; and it may be here remarked, that this is a point worthy of attention in the classification of the *Vespertilionidæ*.

The lower jaw so closely resembles that of the generality of the *Vespertilionidæ*, that I consider it only necessary to state that it appears to resemble the same part in *Scot. Noctula* as closely as in any other species, differing only in having the coronoid process a little more elevated.

Commencing the description of the teeth themselves with the upper incisors, I find them to be two in number, short and conical, and furnished with a distinct *cingulum*, which passes into a point on the hinder side of the tooth, well defined in some species, but scarcely observable in others. In those in which it does occur, it constitutes a peculiarity quite distinct from the bifid incisors of some species, such as the *Barbastelle*, where the *cingulum* is left entire, and the apex of the tooth appears as if cleft.

The canines are somewhat shorter and relatively a little stouter than in *Vespertilio* and *Plecotus*, and also shorter but not stouter than in *Scotophilus*. The next tooth, the only premolar in the upper jaw, and the following three true molars, have the form and proportions so usual in the *Vespertilionidæ*, that they require no special notice, excepting to state that the posterior one is a little smaller than is generally observable.

In describing the teeth of the lower jaw, two errors which have been made respecting their number require correction. Dr. Leach states that the lower incisors are six in number, and M. Temminck, describing afterwards from the same specimen, could find but four. After diligently examining a considerable number of skulls, I have satisfied myself that the account given by Dr. Leach is correct, for in no instance can I discover less than six lower incisors; but in two examples the outer one on each side is wholly hidden by the one next to it, so that unless the skull be carefully cleared of the investing membranes, it would be extremely difficult to see more than four of these teeth; hence has probably arisen the error.

They are cylindrical at the base, and for a considerable part of their length; but expand into flattened fan-shaped summits, having three lobes or points. The canines are of the usual form, and are not, as has been stated, furnished with a posterior lobe or spur. What has been mistaken for a part of the canine, is in fact a small and pointed premolar, placed so close behind it as to seem continuous with it. On instituting an examination of the canines, and comparing them with those of other species, I find that the *cingulum* is not so much developed posteriorly as in many others. In the common *Noctule*, for instance, although the canine presents only a mere trace of thickening of the base anteriorly, it nevertheless passes into a small but distinct spur or point behind. The small anomalous premolar alluded to is situated in the same line with the teeth, between which it is placed in such a manner as to be equally visible from within or without. Its form is conical. The next tooth is also regularly conical, and furnished with a broad basal collar or *cingulum*; after this come the three true molars, presenting the form common to all the *Vespertilionidæ*.

The dentition of the genus may be given as follows; and as that

of all the species is numerically similar, it will render repetition unnecessary.

Dentition.—In. $\frac{1.1}{6}$; C. $\frac{1.1}{1.1}$; P. M. $\frac{1.1}{2.2}$; M. $\frac{3.3}{3.3} = \frac{12}{18}$.

1. *NYCTOPHILUS GEOFFROYI*, Leach.

Nyct. Geoffroyi, Leach, Linn. Trans. xiii. p. 73, 1820–22; Less. Man. p. 86, 1827; Fisch. Synop. Mamm. p. 135, 1829; Temm. Mon. ii. p. 47, 1835–41; Wagn. Supp. Schreb. i. p. 442, 1840; Less. Nouv. Tabl. Règn. Anim. p. 33, 1842; Schinz, Synop. Mamm. i. p. 217, 1844.

Of the four species treated of in the present monograph, the first, from its size, is unquestionably the one on which Dr. Leach established the genus.

The original description in the Linnæan Transactions is much too vague to discriminate the exact species with certainty; but M. Temminck having become possessed of the original specimen, and given a more detailed description of it, I am enabled to determine with certainty which of the species here given is the true *N. Geoffroyi*.

I intend, therefore, first to give a description of this species, and then to point out briefly what I consider sufficient differences to constitute three other species. One of these has indeed been repeatedly described as a *Vespertilio*—*Vesp. Timoriensis*; but it is strictly a *Nyctophilus*, as I have ascertained by the examination of the original specimen in the Paris Museum.

The face is moderately hairy, the hairs being pretty regularly scattered, but a little thicker on the upper lips and on the second nose-leaf than elsewhere. Immediately over the eye is a small tuft of bristle-like black hairs, and a similar one near the hinder corner of the eye. At the angle of the mouth a few similar hairs may be observed. The fur of the back extends to a very trifling extent on to the interfemoral membrane, but all the other membranes are perfectly naked, and of a dark brown colour, as are also all the other naked parts, with the exception of the tragus and the contiguous parts of the inside of the ear, which are brownish-yellow.

The fur of the body is rather long, thick, and very soft.

On all the upper parts it is conspicuously bicoloured, black for nearly two-thirds of its length, the remainder being olive-brown, of which the extreme tips are rather the darker portion. On the membrane uniting the ears the fur is uniform yellowish-brown.

The fur of the throat and flanks is uniform brownish-white, that of the latter being sometimes more strongly tinted with brown. All the remaining under-parts have the fur markedly bicoloured, black at the base, with the terminal third brownish-white, varying considerably in purity of colour in different individuals.

In the following table of dimensions, the first column refers to a specimen in Mr. Gould's collection, very kindly lent by him for my use, and from which the foregoing description has been taken: it is labelled "Albany, King George's Sound, May 19th, 1843." The

dimensions in the two other columns have been taken from specimens in my own collection, and are also from Western Australia, but the exact locality unknown.

The comparative description and measurements of the crania of this and the other species will be given in a collected form appended to the description of the species the last on the list, so as to render their differences more readily apparent:—

	1.		2.		3.	
	in.	lin.	in.	lin.	in.	lin.
Length of the head and body (about)..	1	8	2	0	1	9
——— of the tail	1	4	1	5	1	5
——— of the head	0	7 $\frac{1}{2}$	0	8	0	8
——— of the ears	0	9	0	9	0	9
——— of the tragus	0	2 $\frac{1}{2}$	0	3	0	3
Breadth of the ears	0	6	0	6 $\frac{1}{2}$	0	7
——— of the tragus	0	1 $\frac{1}{4}$	0	1 $\frac{1}{4}$	0	1 $\frac{1}{2}$
Length of the fore-arm	1	4	1	4	1	4
——— of the longest finger	2	4	2	6	2	6
——— of the fourth finger.....	1	9	1	10	1	10
——— of the thumb	0	2 $\frac{3}{4}$	0	3	0	3 $\frac{1}{2}$
——— of the tibia	0	7	0	7 $\frac{1}{2}$	0	7
——— of the foot and claws	0	3	0	3 $\frac{1}{2}$	0	3 $\frac{1}{4}$
——— of the os calcis	0	5	0	6	0	6
Expanse of wings, about	9	0	9	7	9	9

2. NYCTOPHILUS TIMORIENSIS.

Vesp. Timoriensis, Geoff. Ann. du Mus. viii. p. 200. t. 47, 1806; Desm. Mamm. p. 146, 1820; Fisch. Synop. Mamm. p. 118, 1829; Temm. Mon. ii. p. 253, 1835-41; Wagn. Supp. Schreb. i. p. 520, 1840; Schinz, Synop. Mamm. i. p. 175, 1844.

Vesp. Timoriensis?, Temm. Mus. Leyd.

Plecotus Timoriensis, Less. Man. p. 97, 1827; Is. Geoff. Guérin Mag. de Zool. 1832; Less. Nouv. Tabl. Règn. Anim. p. 23, 1842.

The forms of this species are so similar to those of the last, that it is needless to enter at greater length into details of description than is necessary to point out the differences between the two.

In all the specimens I have been able to examine, viz. the original one in the Paris Museum, and three others collected in Australia by Mr. Gould, the ears are strongly sulcated, even more so than is observable in the *Plecotus auritus*, whilst in the preceding species they are very faintly, if at all, so marked; and instead of the small tufts of bristle-like hairs about the eyes, the present species has a tolerably regular series of similar ones fringing the eyelids. Again, the cranium has so strongly marked a sagittal crest as to be easily detected in the mounted specimens, whereas in *N. Geoffroyi* it is so feebly developed that no trace can be discovered, unless the skull be extracted and carefully cleaned.

But the great difference in the size of the two animals is alone sufficient to distinguish them, the one being only 9 inches in expanse of wings, whilst the other attains fully 13 inches; nearly as great a difference as exists between the *Pipistrelle* and the *Noctule* Bats.

The fur of the upper parts is bicoloured, nearly black at the base, with the terminal half dark sepia-brown; that on the top of the head and on the membrane uniting the ears, unicoloured, and paler.

Beneath, the fur has the basal half nearly black, the remainder being light brown, palest on the throat, on the middle of the belly, and on the pubes. On the shoulder of one example from "Perth, Western Australia," is a patch of brownish rust-colour, but it does not occur in the other examples.

Although the original specimen of this species is reported to have been received from Timor, I am inclined to believe that there may have been some mistake respecting its locality. Among a great number of Bats from that island contained in our museums and that of Leyden, representatives of this genus do not appear; but specimens absolutely identical with the original in the Paris collection have been obtained by Mr. Gould in Western Australia; and I have noted one in the Leyden Museum, also from Australia, but without any precise indication of locality.

The following dimensions have been taken from specimens collected by Mr. Gould, the first being the one from Perth, Western Australia:—

	1.		2.	
	in.	lin.	in.	lin.
Length of the head and body, about ..	3	0	2	4
———— of the tail	1	10½	1	10
———— of the head	0	10	0	10
———— of the ears	0	10	0	10
———— of the tragus	0	3½	0	3½
———— of the fore-arm	1	9	1	9
———— of the longest finger	3	4	3	2
———— of the fourth finger	2	4	2	5
———— of the thumb	0	4½	0	4
———— of the tibia	0	9	0	9
———— of the foot and claws	0	5	0	5
———— of the os calcis	0	7	0	8
Expanse of wings, following the phalanges	13	6	12	9

3. NYCTOPHILUS GOULDI, n. s.

The present species is intermediate in size between the two last, and at first sight might be taken either for a small individual of *N. Timoriensis*, or a large one of *N. Geoffroyi*; or these two might be regarded as the large and small varieties of the same species, and the present one as the intermediate or connecting link. This opinion I was at first disposed to entertain; but after the examination of a greater number of examples, and more especially after extracting

a good number of their crania, I became convinced that they were all specifically distinct.

The shape of the head, face and ears does not differ materially from that of the same parts in the two preceding species; the only perceptible difference beyond that of size being in the somewhat greater elevation of the top of the head. As in *N. Timoriensis*, the ears are strongly sulcated, and it bears a general resemblance to that species in the quality and colouring of the fur.

The fur of the whole of the upper parts is very distinctly bicoloured: it might almost be called tricoloured; the basal half greyish-black, and the terminal half grey-brown, with the tips browner. On the rump the brown colour is rather more conspicuous than on the fore part of the back. The basal part of the upper surface of the interfemoral membrane is a little hairy in some specimens, but in others this is not observable.

On the whole of the under-surface the fur is strongly bicoloured, nearly black at the base, with the terminal third buffy grey. On the pubes the dark colour at the base of the fur is reduced to a small quantity, and it is almost wholly of the buffy-white colour.

Young examples not having the wing-joints completely ossified, differ only in being somewhat smaller, and in having the fur less bright; but it is nevertheless distinctly bicoloured, and when obviously immature they are still of greater size than adult examples of *N. Geoffroyi*.

In the table of dimensions, column No. 1 refers to a female specimen from Mr. Gould's collection from Moreton Bay; No. 2 to a male from the same locality; and No. 3 to a specimen also collected by Mr. Gould at Bathurst.

	1.		2.		3.	
	in.	lin.	in.	lin.	in.	lin.
Length of the head and body, about . .	1	11	2	0		
——— of the tail	1	10	1	8		
——— of the head	0	9	0	9		
——— of the ears	1	0	0	11		
——— of the tragus	0	3	0	3		
Breadth of ears	0	8	0	8		
——— of the tragus	0	2	0	2		
Length of the fore-arm	1	7½	1	6½	1	7
——— of the longest finger	3	0	2	8	2	9
——— of the fourth finger	2	4	2	1	2	0
——— of the thumb	0	4¼	0	4	0	4½
——— of the tibia	0	10	0	8½	0	8½
——— of the foot and claws	0	4	0	4	0	4½
——— of the os calcis	0	6	0	6	0	6½
Expanse of wings	11	6	10	9	11	4

4. NYCTOPHILUS UNICOLOR, n. s.

All the specimens of this genus I have yet seen from Van Diemen's Land differ remarkably from those of the mainland of Au-

stralia in having the fur everywhere short and cottony, perfectly devoid of lustre, and unicoloured.

That of the upper parts is of a dark olive-brown, without any variation of tint, excepting that it is perhaps a little darker along the middle of the back than elsewhere.

Beneath, the fur is similar, but paler in colour, with the tips of the hairs a little tinged with ash-colour. This is the colour of the whole of the under parts, with the exception of a patch on the throat, which is whitish-brown, dirty white, and occasionally pure white.

Immature examples often have the fur above and beneath of a very dark olive-brown, almost black. One specimen of this dark colour which I have examined, has the spot on the throat almost pure white.

So far as I have been able to ascertain, this species is subject to very trifling variations either in colour or size in the adult state, and the size agrees so closely with that of the species which I have called *N. Gouldi*, that I at first thought the great difference in the texture and colour of the fur was due to the difference of locality.

In the crania, however, I find such differences as are amply sufficient for the distinction of the species*.

The following dimensions are taken from three specimens collected by Mr. Gould in Van Diemen's Land; the first a male, and the second a female, both adult; and the third obviously immature.

	1.	2.	3.
	in. lin.	in. lin.	in. lin.
Length of the head and body (about)	2 0	2 2	1 10
— of the tail	1 10	1 8	1 7
— of the head	0 8½	0 9	0 8½
— of the ears	0 10	0 10	0 9½
— of the tragus	0 2	0 1¾	0 2
Breadth of the ears	0 7½	0 8	0 7½
— of the tragus	0 2	0 1¾	0 1½
Length of the fore-arm	1 7½	1 7	1 6½
— of the longest finger	2 10	2 8	2 1
— of the fourth finger	2 2	2 8	2 0½
— of the thumb	0 4	0 4¼	0 4
— of the tibia	0 8½	0 7½	0 7
— of the foot and claws	0 4½	0 4	0 3¾
— of the os calcis	0 7	0 6½	0 7
Expanse of wings	11 6	11 0	10 4

The crania of the four species here described differ so considerably, that I deem it advisable to make mention of them apart from the foregoing description. By adopting this plan, I am enabled to bring them into more immediate comparison, which is

* To the description of this species should have been added, that the ears are destitute of sulci, and more membranaceous than in the other species, and that the wing-membranes are darker in colour and much more opaque and leathery.

highly desirable when we bear in mind the small size of the objects, and the consequent difficulty of rendering apparent their differences without the aid of figures. They will be described in the following order, the crania of the two species most removed from each other being found to be most dissimilar.

N. Timoriensis.—General form of the skull rather broad and flat, and rather thick in substance; sagittal and occipital crests moderately developed; depression of the nasal bones of nearly equal depth from side to side, broad, with the sides parallel for three-fourths of its length in a backward direction, and then narrowing rapidly to a point at the commencement of the sagittal ridge. Facial portion short; zygomatic arches considerably expanded. Palate nearly as wide anteriorly as posteriorly. Lower jaw strong, its lower margin considerably curved. All the teeth of moderate size and proportions.

N. Gouldi.—General form of the skull much less broad than in the last species, more elevated in the crown, and narrower anteriorly; sagittal crest considerably developed, the occipital one very small; facial depression almost obsolete, narrow, rounded-off on each side, and only amounting to a concavity just at the posterior termination of the nasal bones. Facial portion relatively more produced than in the last species; zygomatic arches but little expanded. Palate much narrower in front than behind. Lower jaw as in the last species. All the front teeth, especially the upper canines, *very short and stout*.

N. unicolor.—General form of the skull very short, as broad relatively as in the first species, but not so flat, and much lighter and thinner in substance than in either of the preceding; sagittal ridge merely rudimentary, occipital one considerably elevated, especially its central portion; facial depression broad, of medium depth, well-defined, and narrower before and behind than in the middle, and with the outline of the nasal bones rather distinctly marked. Facial portion of medium length; orbits much produced in a forward direction, leaving but a small space between them and the roots of the canines; zygomatic arches a good deal expanded. Palate short, nearly as broad in front as behind. Lower jaw short and light, with a moderate degree of curvature. All the front teeth short and small.

N. Geoffroyi.—General form of the skull differing from that of all the others. It is rather long, narrow, and depressed, with a total absence of ridges or crests, and the occipital region rounds-off posteriorly without any angularity. It is thin and somewhat diaphanous; facial depression narrow, deep in the centre, not clearly defined anteriorly, and passing further back than in the other species, its posterior portion being indicated by two thread-like lines which converge to an acute point on the fore part of the central region. Facial portion of medium length, and narrowed anteriorly; zygomatic arches but very little expanded. Palate much narrower in front than behind. Lower jaw slender, with the lower outline nearly straight. Front teeth proportionally long and rather strong.

The crania of these species present the following dimensions :—

	<i>N. Timoriensis.</i> in. lines.	<i>N. Gouldi.</i> in. lines.	<i>N. unicolor.</i> in. lines.	<i>N. Geoffroyi.</i> in. lines.
Length from the condyloid fossa to the anterior margin of the maxillary bone	0 6	0 5½	0 4½	0 4½
Length from the hinder margin of the parietal bones to the anterior margin of the maxillary bone ...	0 7	0 6¾	0 6	0 5¾
Breadth across zygomatic arches...	0 6	0 5	0 5	0 4½
Greatest breadth of the cerebral region.....	0 4	0 3¾	0 4	0 3¾
Greatest breadth of the facial depression	0 2½	0 2	0 2	0 1¾
Length of the bony palate	0 4	0 3	0 2½
Length of the series of teeth of the upper jaw, exclusive of the incisors	0 3½	0 3	0 2¾	0 2½
Space between the points of the upper canines.....	0 2½	0 2	0 2	0 1¾
Space between the posterior molars	0 2¾	0 2½	0 2½	0 2
Greatest length of the lower jaw...	0 6½	0 5¾	0 5	0 5
Breadth of the lower jaw, taken in a vertical direction from the coronoid process	0 2½	0 2½	0 2	0 1¾
Length of the series of teeth in the lower jaw, exclusive of the incisors	0 3¾	0 3½	0 3	0 3
Space between the points of the lower canines.....	0 1¾	0 1½	0 1½	0 1½

I am especially indebted to Mr. Gould for having placed at my disposal materials which have been of great service in making out the species treated of in the present memoir. The use of specimens collected by him, with the knowledge of their exact localities, has been a great assistance in more respects than one. Besides affording evidences leading to the determination of several species, in a genus formerly supposed to be represented by only one, it has also afforded materials which have tended in some measure to the decision of what constitutes a species and what is only a variety.

It is a well-known fact, that many mammals and birds inhabiting India are found to vary remarkably in size and colour in different parts. Thus if we take some of the Bats as an instance suitable for the present occasion (and we might equally adduce many other mammals and birds) *, we shall find those inhabiting South India and Ceylon smaller and darker in colour than those occurring more northward; and on further examining the matter, we shall further discover that they are referable to the same species, and that intermediate examples may be found at intermediate localities. Not only in external conformation are they similar in their proportions, but also in the details of their osseous system. The skulls of these va-

* Among the Bats may be particularly noticed *Cynopterus marginatus*, *Scotophilus Coromandelicus*, and *Vespertilio papillosus*. See Dr. Kelaart's 'Fauna Zeylanica,' and the appended notes by Mr. Blyth, as also various notices of Mammalia by the latter gentleman in the Journal of the Asiatic Society.

rieties, in which we should expect to find the most constant, and therefore most valuable differences, should any exist, present no variety amongst themselves, excepting that of size; and in this latter respect they bear an exact relation to the varieties to which they belong.

With a series of specimens before me illustrating this, I have extended the same geographical and anatomical tests to the so-called varieties of the present genus. The results of this attempt were by no means similar to those observed of the Indian species; for instead of meeting with anything like the gradation which occurs there, I have found that the largest and the smallest examples were alike inhabitants of Western Australia; whilst a third, which in point of size would have served to unite the two, was separated from them by a wide interval, occurring on the coast of New South Wales. This led to a re-examination of the specimens, and more especially to a comparison of their crania. They were found to be very dissimilar.

Here, then, are two instances, one in which the variation is clearly traceable to an external cause, and accompanied by a uniformity of internal structure, thereby corroborating the unity of the species; and another, in which the variation is not due to any apparent cause, and not only unsupported by anatomical similarity, but the unity of the species is absolutely disproved by the existence of very diverse osteological characters.

Without dwelling longer on this subject, I may observe, that these remarks have arisen, in the first place, from the consideration of some exceedingly judicious observations on the variation of species, delivered at the Meeting of the British Association at Cheltenham in 1856, by the Rev. Leonard Jenyns. I must refer the reader to the communication printed entire in the Report of the Proceedings of the Association for that year, and content myself with observing that that gentleman urged the necessity of duly considering the influence of climatal and other causes in producing varieties of species; and also pointed out, that, in the absence of any such causes, any considerable amount of difference from a known species might be regarded as strong distinctive evidence.

Since the preceding account was written, I have obtained another specimen of *Nyctophilus Timoriensis*, collected in some part of Australia, but I do not know the exact locality.

As it is preserved in spirit, and in good condition, I am enabled to give a better account of the form of the face and nose-leaves than that already given, and thus add at the same time to the specific and generic characters.

The first nose-leaf is slightly emarginate and rises from immediately above the nostrils, in such a manner as to give the end of the nose somewhat the appearance of a disc, in which the nostrils are pierced. Between them and the nose-leaf, however, is a deepish transverse depression, with two pits, one over each nostril, which in some measure destroys the regular disc-like appearance of the end of the snout. The nostrils themselves are pear-shaped, with the

narrow ends curving outwards and upwards until they come in immediate contact with the base of the nose-leaf, on each side. Laterally, and below, they are encompassed by the thickened prominent part of the lip, so that they are seen to occupy the bottom of a shallow depression, and open perfectly in front. Between them is a narrow thread-like ridge. Between the first and second nose-leaf is a small but deep hollow or pit, and the second nose-leaf rises behind this in the form of a thick fleshy or cartilaginous projection, not deserving the name of "leaf," transverse in direction, but much narrower and less prominent than the true nose-leaf, and thickly covered with short hairs. Above this appears the facial depression before described. The lower lip is without hairs in front, but the naked part is not clearly defined, as it is in many *Vespertilionidæ*.

The ears are conspicuously sulcated, and their outer margins extend along the side of the face in a line with the cleft of the mouth, and end at a little more than a line from its angle. The tragus presents some points of difference from that of dried specimens. Near the base of the outer edge are two distinct points, and above them some fine crenulations, which are succeeded by a portion of the margin, which is singularly indented. It appears as if this portion were thickened, and a little produced backward and forward; so that when viewing the front surface of the tragus, this part is seen *edgeways*; and when the edge of the tragus is seen, this part presents a *flat* surface*. Above this space the edge again becomes thin, and is finely crenulated to the tip.

The carpus of the closed wing reaches to the front corner of the eye. The wing-membranes extend precisely to the base of the toes, and the *os calcis* occupies about one-third of the space between the foot and tip of the tail. The latter is composed of eight or nine vertebræ, the small terminal one being disengaged from the membrane. All the claws—of wings and feet—are singularly short and weak.

	in.	lin.
Length of the head and body	2	11
——— of the tail	2	0
——— of the head	0	11
——— of the ears	0	10
——— of the tragus	0	3
——— of the fore-arm	1	9
——— of the longest finger	3	4
——— of the fourth finger	2	6
——— of the thumb	0	4
——— of the foot and claws	0	5
Expanse of wings	13	0

* If a thin sheet of any material of a pasty consistence were taken, and pressure applied to a small portion of its edge, so as to thicken it, and raise a kind of *rim* or *bur*, visible on each side of the sheet, it would represent pretty exactly this peculiarity of the tragus in *Nyctophilus*. I may add, that having my attention directed to it, I have been able to detect the same peculiarity in the dried specimens, but much less distinctly visible.